

061306T4CSC

COMPUTER SCIENCE LEVEL 6

ICT/OS/CS/CR/02/6/A

Understand Operating Systems

Nov/Dec 2024



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN ASSESSMENT

Time: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. Marks for each question are indicated in the brackets.
2. The paper consists of **TWO** sections: **A** and **B**.
3. Candidates are provided with a separate answer booklet
4. **DO NOT** write on this question paper.

This paper consists of THREE (3) printed pages
Candidates should check the question paper to ascertain that all
pages are printed as indicated and that no questions are missing.

SECTION A (40 MARKS)

Answer ALL the questions in this section.

1. There are various algorithms used in operating systems. Explain any FOUR criteria for comparing algorithms in operating systems. (4 marks)
2. The dual mode of operation provides us with the means for protecting the operating system from errant users—and errant users from one another. Assuming that a computer system is off, explain how the OS will operate in dual mode. (4 marks)
3. Operating systems perform various activities in process management. List any FOUR activities that the operating system is involved in during process management. (4 marks)
4. In real life operations having an operating system make work easier for system users. Explain how the operating system makes a computer system convenient for users. (4 marks)
5. During normal processing, operating systems encounter deadlocks. List FOUR ways of overcoming deadlocks. (4 marks)
6. Briefly explain the following terms as used in computers (4 marks)
 - i. Disk portioning
 - ii. Physical disk
 - iii. Logical disk
 - iv. Drive mapping
7. Disk formatting is done to make the work of the operating system easier. State FOUR processes involved in formatting a disk for use by an operating system. (4 marks)
8. Back-up refers to the copying and archiving of computer data so it may be used to restore the original after a data loss event. Explain the FOUR different types of backups (4 marks)
9. Explain the work of following; (4 marks)
 - i. **Task bar**
 - ii. **Startup menu**
 - iii. **Help and Support**
10. There are TWO fundamental approaches for users to interface with the operating system. Outline the TWO approaches (4 marks)

SECTION B (60 MARKS)

Answer Any THREE Questions in This Section.

11. One of the major functions of the operating systems is I/O management.
- a) Explain an I/O interface (3 marks)
 - b) Discuss the THREE types of I/O interfaces (9 marks)
 - c) Discuss FOUR roles of operating systems in I/O interface management (8 marks)
12. A computer system carries out processing in various states
- a) Explain what is meant by a multiprocessor system. (2 marks)
 - b) Distinguish between symmetric and asymmetric modes of multiprocessing (4 marks)
 - c) Consider a situation whereby there are 2 processes, P1, and P2, and 3 identical resources R1, R2 and R3. Assuming that each process requires a maximum of 2 resources at any one time, explain if there is a deadlock. Illustrate your answer (7 marks)
 - d) Describe the relationship between an API, the system-call interface, and the Operating System (7 marks)
13. Using your knowledge in file system layers. Answer the following questions
- a) Highlight the TWO functions of the Virtual File System (VFS) layer (4 marks)
 - b) Discuss monolithic kernel, Micro kernel and Exo-kernel architectures (6 marks)
 - c) Discuss the difference between Time-sharing and Real-time systems (4 marks)
 - d) Explain THREE common fixes you need to keep in mind when exiting the source (6 Marks)
14. Filing is one of the processes carried out by the Operating system
- a) Briefly describe the design steps involved when a file system creates a new file (6 marks)
 - b) File systems store several important data structures on the disk explain THREE data structures (6 marks)
 - c) File systems organize storage on disk drives in form of layers. With the help of a diagram discuss these layers (8 marks)

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